

## **LISTING OF THE CLAIMS**

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. **(Currently Amended)** A method for fabricating a high density ceramic thick film at a thickness of 1 - 200  $\mu\text{m}$ , comprising the steps of:  
    ~~providing vehicle comprising an organic binder and solvent;~~  
    ~~dispersing ceramic powders into the vehicle to be a paste;~~  
    preparing a paste by mixing a PZT-based ceramic powder with a vehicle comprising an organic binder and a solvent;  
    forming the paste to thick film by screen printing;  
    removing the organic binder from the film at 400 - 700°C;  
    ~~applying sol or sol-like solution to the surface of the film so that the sol or sol-like solution can infiltrate into the film, the sol-like solution being a material that can be processed as a solution by a sol-gel process~~ a PZT-based sol or a solution of an alkoxide, hydrate or carbonate of PZT components, or mixtures thereof, to the surface of the thick film, so as to infiltrate the thick film;  
    ~~removing the remaining sol or sol-like solution~~ PZT-based sol, or the solution of an alkoxide, hydrate or carbonate of PZT components, or mixtures thereof from the surface of the thick film by spinning the film;  
    drying and preheating the film; and  
    sintering the film at the range from 700 to 1200 C.

2. **(Canceled)**

3. **(Currently Amended)** The method of claim 1, wherein ~~the sol or sol-like solution~~ are has identical components with the ceramic powder components of the PZT-based ceramic powder in step (1) are the same as components of the PZT-sol, or the solution of an alkoxide, hydrate or carbonate of PZT components, or mixtures thereof in step (4).

4. (Currently Amended) The method of claim 1, wherein ~~the sol or sol-like solution are not identical components with the ceramic powder~~ components of the PZT-based ceramic powder in step (1) are different from components of the PZT-sol, or the solution of an alkoxide, hydrate or carbonate of PZT components, or mixtures thereof in step (4).

5. (Currently Amended) The method of claim 1, wherein ~~the thick film is densified by forming a thick film with a certain thickness by screen printing, then having the sol and sol-like solution infiltrated into the surface of the thick film and performing the process repeatedly more than twice~~ steps (3) to (5) are performed repeatedly at least twice between steps (5) and (6) to densify the thick film.

6. (Currently Amended) The method of claim 1, wherein the sintering is performed at a temperature is of 800 to 900 C.

7. (Canceled)

8. (Currently Amended) A method for fabricating a high density ceramic thick film at a thickness of 1 - 200  $\mu m$ , comprising the steps of:  
preparing a paste by mixing a PZT-based ceramic powder and a PZT-based sol with a vehicle comprising an organic binder and a solvent;  
~~providing vehicle comprising an organic binder and solvent;~~  
~~dispersing ceramic powders into the vehicle to be paste;~~  
forming the paste to thick film by screen printing;  
removing the organic binder from the thick film at 600 - 700°C;  
~~applying sol or sol-like solution~~ a PZT-based sol, or a solution or an alkoxide, hydrate or carbonate of PZT components, or mixtures thereto, to the surface of the thick film so as to infiltrate ~~that the sol or sol-like solution can infiltrate the thick film;~~ and  
sintering the thick film at 600 to 700°C.

9. (Currently Amended) The method for fabricating a high density ceramic thick film at a thickness of 1 - 200  $\mu m$ , comprising the steps of:

preparing a paste by mixing a PZT-based ceramic powder with a vehicle comprising an organic binder and a solvent;

~~providing vehicle comprising an organic binder and solvent;~~

~~dispersing ceramic powders into the vehicle to be paste;~~

forming the paste to thick film by screen printing;

removing the organic binder from the thick film at 400 - 700°C;

applying a PZT-based sol, or a solution of an alkoxide, hydrate or carbonate of PZT components, or mixtures thereof, sol or sol-like solution to the surface of the thick film so that ~~the sol or sol-like solution can infiltrate~~ as to be infiltrated into the thick film;

removing the remaining PZT-based sol, or the solution of an alkoxide, hydrate or carbonate of PZT components, or mixtures thereof sol or sol-like solution from the surface of the thick film by spinning ~~the film~~;

drying and preheating the film at 80 - 600°C;;

sintering the thick film at 700 - 900°C;;

applying a PZT-based sol, or a solution of an alkoxide, hydrate or carbonate of PZT components, or mixtures thereof, sol or sol-like solution to the surface of the thick film ~~again~~ so that ~~the sol or sol-like solution can infiltrate~~ as to infiltrate the thick film; and

sintering the thick film at 600 - 700°C;.